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Research Article

How to keep Farm Products and Soils Healthy in Agricultural Chemicals as well as a Human Body

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Abstract

Our health on the earth has been threatened since the middle of the 1990s. Mostly, Flood and droughts due to climate change also affect the food supply in agriculture. We need healthy soils, clean water, and sunlight as well known. On the other hand, they want enough harvest and efficiency in plant growth. However, they are also a necessary theme for everybody globally, and they fertilize and spray pesticides containing various chemical medicine. As a result, we may damage, and the risk will be spread because of scattering from the air. Therefore, what we take the balance of these themes must be an increasingly imminent issue. Therefore, the purpose of the article is to inform why we use SIGN water so that we can achieve decrease of the damages with agricultural chemicals, and good harvest to use it. Here, we propose the usage of pesticides as little as possible so that we reduce the effects on crops and soils with our pico-sized water.

Keywords: agricultural; medicals; pico-sized water; hydrogen bond; reduction

Introduction

Agriculture is a chief and primary industry globally with an increasing population. On the other hand, climate change has affected the farms (crops) and soils, such as floods and drought. Furthermore, they look for a quick buck of harvest and productivity. Any plants need sunlight, water, and soil to grow as well known. As a result, they routinely use agricultural medicines, fertilizer, and insecticides. What may cause harm to insects indeed happens to give some damage to the human body, even cancer [1]. The medical products and the kind must be different from the country in the world. There are various sorts of approved chemical and weed killers depending on the country because the weather, harmful insects, and herbicides are different in every country. On the other hand, research on herbicides to get rid of weed numbers across vast areas can result in overgrowth or new faces of herbicides [2].

We cannot cover all of them in the world. Therefore, we must develop the universal principle of extermination so that the chemical structure of the substances in an agricultural chemical may be necessary as one of the methods.

We describe their toxicity associated with the particular element in the chemicals, and we elucidate why the specially-processed water may function to remove poison.

Cadusafos is a chemical employed widely, such as fumigator, to kill insects in a room and a container. For instance, cadusafos is forbidden in France but in no other country [3, 4]. Tolfenpyrad of insecticides was discovered in Japan [5] but is not registered in other countries.

We can introduce another kind of agricultural chemical except the two described above. Other ones are cadusafos, captan [6-8], procymidone [9, 10], pendimethalin [11, 12] from the standpoint of antimicrobial agents and fosthiazate [13]. An agricultural chemical depends on the country relating to the development of the chemical, soils, fertilizer, and crops regardless of the climate. Therefore, we focus on the agricultural chemical in Japan.

The essential theme is the function of SIGN water (Spin Information Gauge Network) [14] to the agricultural chemical, and we introduce an outline of SIGN water at first. Then, the mechanisms of the reactions between the water and the chemical may expand to another pesticide in ubiquity corresponding to the chemical structure and the state of an electron in the compounds. We notice covalent bond strength in every element and electron affinity of each atom involved in the pesticide compound. Here we report five kinds of agricultural chemicals. Here, we propose the usage of pesticides as little as possible so that we reduce the effects on crops and soils with our pico-sized water.

The purpose of the article is to inform why we use SIGN water so that we can achieve decrease of the damages with agricultural chemicals, and good harvest to use it.

Material & Methods

We reported the quantum mechanical existence as the basic of SIGN water as materials, higher pressurized water than 100MPa. Then the SIGN water supposedly contains the elementary-like particle, which I name Infoton, <$H^{+\sim}e^{-}$>. It is neither a hydrogen atom nor anion, and two particles oscillate at the far-infrared frequency through terahertz, and Infoton continues to exist stably. We reported the quantum mechanical existence as the basic science of SIGN water after hydrogen bond dissociation [15].

Results & Discussion

Here we focus on the chemical structure in which chemical bonding strength between each element is attractive when discussing the effectiveness of SIGN water as an agricultural chemical. Before explaining the medical, we show the outline of SIGN water first.

SIGN water

Initially, it was tap water in Yokohama city, Japan, and we did not add anything. We perform the tap water to add higher pressure than 100MPa for 15min so that we assume the pressurized water involves the elementary-like particle after dissociating its hydrogen bonds. We can calculate the bond strength, 0.03~0.05eV, corresponding to the redundant entropy [16]. Furthermore, the specially-processed water (SIGN water) may emit the far-infrared (10μm through terahertz (~10 THz) according to our measurement of the dielectric constant of water. Usually, water absorbs the long electromagnetic wave, but SIGN water can transmit the longer waves because of containing the picometer size particle. We proposed the basic idea for elementary particle-like behaviors, a hypothetical particle, and Sugihara names it infoton, <$H^{+\sim}e^{-}$> [17]. The infoton possesses information relating to spin and momentum (mass and velocity) corresponding to 1.18MeV calculated by supposing the 5% of light speed. That is why infoton can react with radioactive cesium resulting in a change to the stable element of barium [18, 19]. Therefore, SIGN water possesses the nuclear transforming capability to access a nucleus. We reported chemical reduction relating to the electrons outside the nucleus with experimental results. Here we say the mechanism to reduce any damage with an agricultural chemical as less as possible since agricultural chemicals may not be neglected.

Countermeasure against agricultural chemicals

We elucidate the five chemicals described above and discuss how we can reduce damage to the crops, our bodies, and soils as small as possible. The effectiveness and functions of an agricultural chemical itself are recommendable to consult with professional textbooks.

Cadusafos

Firstly, we introduce cadusafos, an active substance of certain plant protection products with an insecticidal and nematode effect. Furthermore, cadusafos is one of the active ingredients in agricultural medicals [20].

Due to their toxicity, cadusafos have been banned in France since 15 December 2008 [21]. We show the molecular structure in Fig. 1.

It is the organ phosphorus compound containing carbon (C; $2S^22P^2$), phosphorus (P; $3S^23P^3$), and sulfur (S; $3S^23P^4$) except for hydrogen and oxygen in cadusafos. But we pay attention to two elements mostly. In the electronic configuration of carbon, the 2*S* orbital occupies two electrons and two electrons in the 2*P* orbital. When we onside sulfur atom, two electrons occupy the S orbital and four electrons in the P orbital. Now looking at phosphorus, the electron configuration of phosphorus is $3S^23P^3$.

The meaning of C; $2S^22P^2$ is that the second S orbital involves two electrons, and in phosphorus, the thirds orbital has two electrons, and the third *P* orbital has three electrons. Three Pelectrons in Pleading to stronger binding in P-S, P-O, and P=O, because there is an unoccupied position in the *P* orbital. We can estimate more diminutive than the energy of 1.64eV, which is a lower covalent bond in the P-S bond.

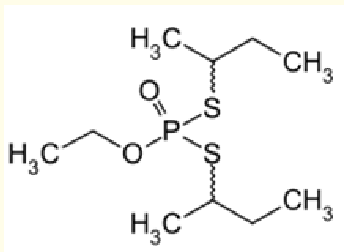

Figure 1: Molecular structure of cadusafos. The molecular structure is $C_{10}H_{23}O_2PS_2$. The molecular weight is 270.39g/mol.

Therefore, infoton may attack P-S, then bind C-S resulting in no function of an agricultural chemical.

Captan

The medicine is the fungicide. Downy mildew is general use for a pesticide that belongs to fungicides. Both agricultural growers and homes utilize captan. Furthermore, they apply captain during apple production, and it is also active against pythium for controlling damping off. On the other hand, the US EPA has Cancer Reclassification (Environmental Protection Agency) [22-24].

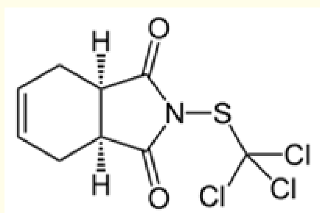

Figure 2: Molecular structure of captan. The molecular weight is 300.6g/mol.

The sulfur (S) electron configuration is $3S^23P^4$, chloride; $3S^23P^5$, nitrogen; $2S^22P^3$and $2S^22P^4$ for oxygen. Now, we elucidate the electron affinity difference between each atom involved in the bindings. Firstly, C-S binding in which difference (Δ) is 0.84eV, 1.3 for N-C, 2.2eV for N-S, and 2.4eV for C-Cl in the order of smallness except for 0.52eV of C-H in a benzene ring. The strength of covalent binding in C-S is the weakest of the other bindings meaning that Cl is easy to leave without meaning for a fungicide.

This phenomenon is supposed to relate to the lone-pair electron of 3*P* in the Cl electronic configuration, and infoton can quickly attack the C-Cl binding.

Procymidone

It is a general pesticide of any substance used to kill insects and other pests and wd often used for killing unwanted ferns and nettles. Procymidone is a family fungicide of agricultural chemicals dicarboximide (or dicarboxamide). The pesticide is said to obstructa hyphaelongation, a known endocrine disruptor. Strawberry is a bumpy surface, so procymidone residues easily [25-28]. Furthermore, the pesticide is one of the environmental hormones that disturbs the organism's reproductive function. E.U. prohibits using it.

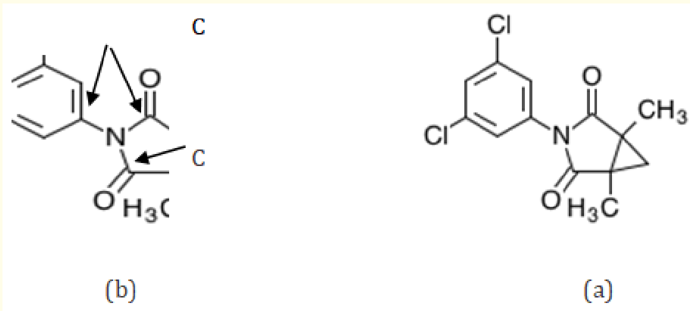

Figure 3: (a); Molecular structure of procymidone whose molecular weight is 284.1g/mol. (b); two types of N-C binding in procymidone. One is N-C=O, and another is N-C=C.

The electronic configuration here is $3S^2 3P^5$ for chloride, directly bound with carbon (N-C=C) in a benzene ring. Another one is the bindings in N-C=O. We compare covalent bond strength and electron affinity in two types of structures; the former, N-C=C, the difference between N-C and C=C is 3.1eV, leading to easier broken than 5.1eV in the N-C and C=O. Furthermore, carbons are apt to give electros to nitrogen in terms of an electron affinity rather than the latter case, N-C=O. As a result, the N-C bond in N-C=C may break easier, leading to no pesticide function.

Pendimethalin

Is an herbicide that works for annual weeds. Pendimethalin protects Chinese cabbage, potato, corn, wheat, and soybeans. It functions to control weed growth resulting in death due to the inhibition of cell division when weeds germinate and sprout [29-31].

On the other hand, they reported the incidence of pancreatic cancer in the research [32]. However, no compelling data exists that it causes pancreatic or other cancer. It remains in good standing with the regulatory agencies in virtually all world markets. The treatments are the processes to keep the quality of foods and crops after harvests, such as agricultural medicines and radiation preventing mold and rot. We must pay attention to any cancer with drugs [33].

We focus on the bonds and elements in pendimethalin, which is comparatively simple rather than the three described above; there are two groups here. One is C-N-O, and another is C-N-H.

When we compare the electron affinity in C-N-O (8.46eV) and C-N-H, the affinity in N-H (7.73eV) is less than N-O resulting in a more accessible brake in the former.

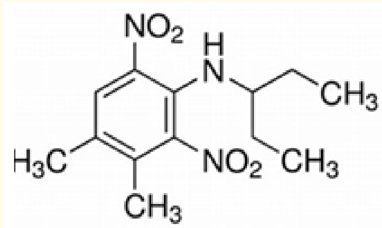

Figure 4: Molecular structure of pendimethalin. The molecular weight is 281.3g/mol, and the formula; is $C_{13}H_{19}N_3O_4$. Solubility in water is 0.275ppm.

Fosthiazate

The medicine is a phosphonic ester, an organic phosphonate, and an organic thiophosphate insecticide. It has a role as an EC 3.1.1.7 (acetylcholinesterase) inhibitor, an agrochemical, and a nematicide soluble in water [13].

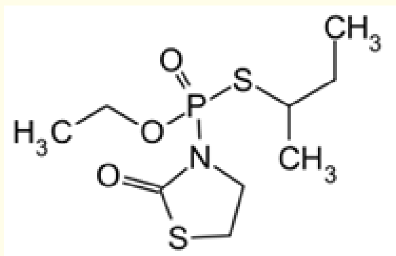

Figure 5: The molecular structure of fosthiazate and the weight is 283.4g/mol with the formula; $C_9H_{18}NO_3PS_2$.

It looks the same as cadusafos with the elements of phosphor and sulfur. First of all, the difference between them is molecular structure centering phosphor; P=O, P-S, P-O, and P-S in cadusafos. Meanwhile, P=O, P-O, P-S, S-C-CH3 (or S-C-CH), and P-N in which edge is a Penta-ringin fosthiazate. And fosthiazate is the most complex, as explained before. The weakest bond is supposed to be S-C (electron affinity; 0.84eV); the next one is P-O (1.01eV) which infoton attacks the bonds.

Agricultural medicals	***A covalent bond, lowest C.B. (eV)***	***electron affinity, the difference (Δ eV)***
cadusafos	*P-S*; 1.64	*P-S*; 1.64
captan	*C-S*; 2.8	*C-S*; 0.84
procymidone	*N-C;* 3.2	*N-C*(=C); 1.3
pendimethalin	*N-O*;2.1	*N-O*; 1.5
fosthiazate	*P-S;*1.64	*P-S;*1.64

H	***1S***	***0***
C	$2S^22P^2$	Four vacant, *P*
N	$2S^22P^3$	Three vacant
O	$2S^22P^4$	Two vacant
P	$3S^23P^3$	Three vacant
S	$3S^23P^4$	Two vacant
Cl	$3S^23P^5$	One vacant

Table 1: Focus on an element, group of bonds, and element configuration of an atom. (Emsley 1998).

LED lamp/number	*Before the change of lamp*	*After a change of lamp*	*Reduction change/%*
40	413	258	37.5
Different place above	420	214	49.0
30 different room	473	379	19.9

Table 2: Shows the deodorization of volatile organic compound (VOC) using the activated LED lamps on the ceilingin the track paint factory.

We can tell to elucidate the cause of taking off methyl radical (CH_3) from a benzene ring; The methyl radicals in toluene and xylene may be attacked by infoton emitting from the activated LED lamps with no odor of toluene and xylene. Although this is not the case with pesticides, the C-C bond (3.6eV) with benzene ring in the solvent is more accessible to separate than C-H (4.3eV) in methyl radical.

Conclusion

We discussed the effect reduction on crops and humans about the five kinds of agricultural medicals. We noticed each element's binding strength and electron configuration in the chemical compounds and reaction with the activated water, SIGN water containing the pico-sized particle, infoton fabricated by the pressurized tap water (more than 100MPa). The water and the LED lamp have given specific information that the SIGN water can also work for the same function showing the deodorization of the organic solvent.

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